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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,944	09/09/2003	Hiroyuki Nakamura	MTS-3462US	1606

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EXAMINER	
SUMMONS, BARBARA	
ART UNIT	**PAPER NUMBER**
2817	

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

EK

Office Action Summary	Application No.	Applicant(s)	
	10/657,944	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Barbara Summons	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/3/05 (amendment) & 12/5/05 (RCE)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,8,11-22 and 24-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,2,8,11-22,24-26 and 30* is/are allowed.

6)☒ Claim(s) *27-29,31,33 and 38-46* is/are rejected.

7)☒ Claim(s) *32 and 34-37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03 November 2005 has been entered.

Claim Objections

2. Claim 40 is objected to because of the following informalities:

In claim 40, on line 2, note that the "a" before "bulk" should be deleted as was already done in claim 18. Appropriate correction is required.

New Grounds of Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 27 and 29 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of Claims 27 and 29 recite a "band elimination filter" that has a pass characteristic that "decreases attenuation in a center frequency portion of the pass-band..." which cannot be understood in light of the specification because a band

elimination filter has two pass bands at the upper and lower side of the rejection band. Is Applicant referring to the rejection band as the "center frequency portion of the pass-band"? What is meant by "decreases attenuation in a center frequency portion of the pass-band toward a center-frequency of the pass-band"? Is this an inadvertent redundancy of "center frequency"? Could Applicant's intended meaning be that the inventive band elimination filter has a passing characteristic that increases attenuation "on both sides of" a center frequency portion of the rejection/attenuation band relative to the prior art (see e.g. Fig. 3a vs. Fig. 3b and the paragraph bridging pages 20-21 of the original specification)? Clarification is required.

New Grounds of Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 28, 33, 39, 40 and 44 are rejected under 35 U.S.C. § 102(b) as being anticipated by Rist et al. U.S. 4,903,297 (of record).

Fig. 6c of Rist et al. discloses a band elimination filter (see col. 14, lines 42-43 and 62-68) comprising: an input terminal coupled to a source (132/131) and an output terminal coupled to load (133); a first inductor 137 between a first terminal connected directly to the input terminal and a second terminal (i.e. the node above resonator 135) connected to the output terminal (i.e. via inductor 138); wherein the first terminal is

grounded via only a first grounding point (i.e. the node below resonator 134) by a first acoustic resonator (134) connected therebetween, and the second terminal is grounded via only a second grounding point (i.e. the node below resonator 135) by a second acoustic resonator (135) connected therebetween. Regarding claims 33, 39 and 40, the resonators 134 and 135 are either surface acoustic wave (SAW) resonators formed on a piezoelectric substrate 108 (see Fig. 5c) or piezoelectric bulk acoustic wave (BAW) resonators (see Figs. 5a and 5b) with electrodes 101 and 102 sandwiching a piezoelectric layer 100 (see col. 14, lines 4-5 and 11-12). Regarding claim 44, see e.g. Fig. 11b with multiple filters "F", wherein at least filter 242 is the band elimination filter (see col. 17, lines 8-9).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 31, 38, 43, 45 and 46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rist et al. U.S. 4,903,297 (of record) in view of Hosaka et al. JP 7-263995 (of record).

Regarding claims 31, 38, and 43, Rist et al. discloses the invention as discussed above except for explicitly disclosing two SAW resonators on the substrate with their grounded electrode pads separated from each other and being independently grounded by wires on the substrate that would inherently provide inductors in the same manner as Applicants' invention (see e.g. the specification at page 23, the first full paragraph thereof discussing Fig. 5a). Regarding claims 45 and 46, Rist et al. does not disclose the band elimination filter for use in a SAW duplexer.

Hosaka et al. discloses (Fig. 1) two SAW resonators 3 on a substrate with their ground electrode pads separate from each other so that the separated ground electrode pads (i.e. the two pads toward the center between the two resonators in the figure) are connected to ground via respective independent bond wires (not numbered). Hosaka et al. also discloses that it would have been a well known intended use of SAW/BAW band elimination filter to use them in duplexers in transmit/receive communication devices.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the band elimination filter of Rist et al. (Fig. 6c), if even necessary, such that the SAW resonators would have had separated electrode pads connected to ground by respective independent wires that inherently would have provided first and second inductors, because Rist et al. is silent as to the exact structure of the SAW resonator substrate and connection of the SAW resonators

to the circuit elements and ground, thereby suggesting to one of ordinary skill in the art that any well known manner of connection such as the exemplary wiring bonding suggested by Hosaka et al. (Fig. 1) would have been usable therewith. Even if the SAW resonators of Rist et al. had been connected to ground by the only other manner known being bump bonding, then the replacement of the bump bonding with wiring bonding would have been merely an obvious art recognized alternative connection method for SAW resonators as would have been known by one of ordinary skill.

It would have been equally obvious to one of ordinary skill in the art at the time of the invention, to have used the band elimination filter of Rist et al. in a duplexer transmit/receive communication device, because this would have been merely an obvious intended use of such SAW/BAW band elimination filters as suggested by Hosaka et al. (see Fig. 14 & the abstract) and as evidenced by other prior art of record.

9. Claim 42 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Rist et al. U.S. 4,903,297 (of record) in view of Hikita et al. U.S. 4,803,449 (of record).

Rist et al. discloses the invention as discussed above, except for explicitly disclosing that the acoustic resonators 134 and 135 have different resonant frequencies. Rist et al. does disclose that the resonant frequency of the resonators forms the rejection band of the filter (see col. 14, lines 65-68).

Hikita et al. discloses that in band elimination/rejection filters it is known that by deviating the resonant frequencies of the parallel-arm resonators from one another, that the bandwidth of the rejection band can be enlarged (see col. 6, lines 60-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the band elimination filter of Rist et al., if even necessary, such that the resonant frequencies of the first and second acoustic resonators would have been different from one another, because Rist et al. is silent as to the resonant frequencies of the resonators, thereby suggesting to one of ordinary skill in the art that any resonant frequency settings that would have provided the desired rejection band of each specific application would have been usable therewith, since Rist et al. explicitly suggests that these resonant frequencies form the rejection band (Rist col. 14, lines 65-68), and because deviating the resonant frequencies of the resonators would have provided the advantageous benefit of setting a wider bandwidth of the band rejection filter as explicitly suggested by Hikita et al. (col. 6, lines 60-65).

10. Claim 41 rejected under 35 U.S.C. § 103(a) as being unpatentable over Rist et al. U.S. 4,903,297 (of record) taken alone.

Rist et al. discloses the invention as discussed above, except for explicitly disclosing that the piezoelectric layer of the resonators is a thin film.

The Examiner takes Official Notice that thin film piezoelectric resonators, a.k.a. film bulk acoustic resonators (FBARs) would have been well known art recognized equivalent piezoelectric resonator structures that would have provided the benefits of reduced size, as would have been known by one of ordinary skill in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the band elimination filter of Rist et al. by having replaced the quartz piezoelectric resonators with thin film piezoelectric

resonators, because such an obvious modification would have been merely the substitution of art recognized equivalent acoustic resonators, which would have also provided the advantageous benefit of size reduction.

Allowable Subject Matter

11. Claims 1, 2, 8, 11-22, 24-26 and 30 are allowable over the prior art of record.

12. Claims 32 and 34-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13. Applicant's arguments with respect to claim 28 and those dependent therefrom, have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Garrison et al. U.S. 3,704,433 discloses a band elimination filter (Fig. 8) with an inductor directly connected between the input/output terminals and with two piezoelectric resonators between opposite terminals of the inductor and ground.

Applicants are reminded that Saitou U.S. 6,346,859 (of record) discloses the obviousness of having only a one-stage band elimination filter versus a plurality of stages.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs
February 9, 2006

Barbara Summons

BARBARA SUMMONS
PRIMARY EXAMINER